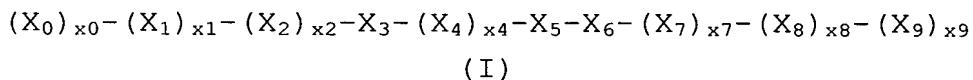


CLAIMS

1. A molecule of general formula (I), and the pharmaceutically acceptable salts thereof:

5

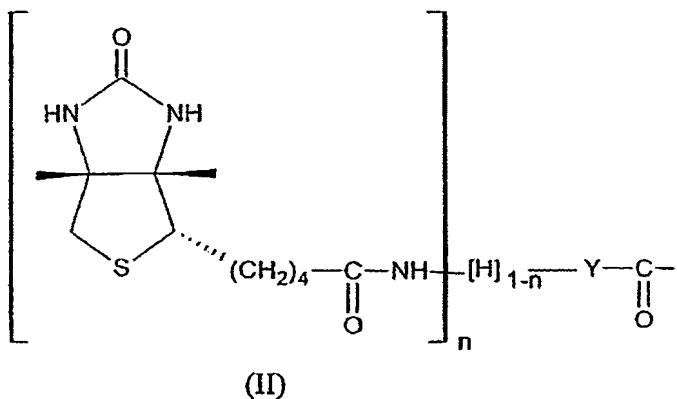


in which

10 - x_0 , x_1 , x_2 , x_4 , x_7 , x_8 and x_9 each represent, independently, an integer equal to 0 or to 1;

- X_0 represents a group chosen from those corresponding to formula (II):

15

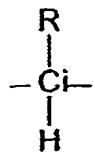


20 in which Y represents a saturated or unsaturated, linear, branched or cyclic C_1-C_{24} alkyl group, n represents an integer chosen from 0 and 1;

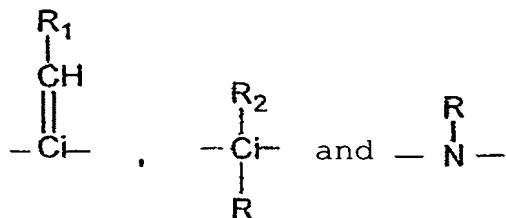
- X_1 and X_3 each represent a natural or synthetic amino acid in the L or D configuration, each comprising at least one hydroxyl function on its side chain;

25 - X_2 represents a natural or synthetic amino acid in the L or D configuration chosen from those comprising an alkyl side chain;

- X_4 represents a natural or synthetic amino acid in the L or D configuration which can be chosen from those comprising an aromatic side chain;
- X_5 represents an amino acid in the L or D configuration chosen from lysine, arginine, histidine, aspartic acid, asparagine, glutamic acid and glutamine;
- X_6 represents an amino acid in the L or D configuration which can be chosen from tyrosine, phenylalanine, leucine, isoleucine, alanine, para-benzoylphenylalanine and lysine;
- X_7 represents an amino acid in the L or D configuration which can be chosen from glycine, alanine, leucine, valine, asparagine and arginine;
- X_8 represents an amino acid in the L or D configuration which can be chosen from proline, valine, isoleucine and aspartic acid;
- X_9 represents an amino acid in the L or D configuration which can be chosen from serine, alanine, lysine, arginine and tryptophan;
- the bond between two successive amino acids X_i-X_{i+1} , denoted q_{i-i+1} , $i = 1, \dots, 8$, can be a peptide bond $-\overset{\text{O}}{\underset{\text{||}}{\text{C}}}-\text{NH}-$ or a pseudopeptide bond chosen from: CO-O, CO-S, CO-CH₂, CO-N(Me), NH-CO, CH=CH, CH₂-CH₂, CH₂-S, CH₂-O, CS-NH, CH₂-NH, CO-CH₂-NH, CO-NH-NH, CO-NH-N= and CO-N(NH₂);
- the amino acids stated above X_i , $i = 1, \dots, 9$, being capable of comprising a modification of their α -carbon, denoted C_i , $i = 1, \dots, 9$, and bearing the side chain R of the amino acid, which modification consisting of the replacement of:



with a group chosen from:



the groups R and CH-R₁ representing the side chain of the amino acid and R₂ representing a C₁-C₆ alkyl group; R-R₂ can constitute a ring,

5 - the pseudopeptides of the invention also corresponding to the following conditions:

• x₀ is equal to 1

or

10 • one of the bonds q_{i-i+1}, i = 1,...8, is a pseudopeptide bond

or

• one of the C_i, i = 1,...9, comprises one of the modifications stated above.

15 2. A molecule as claimed in claim 1, characterized in that one or more of the following conditions is verified:

at least one of the integers x₀, x₁, x₂, x₄, x₇, x₈ and x₉ is equal to 1;

20 X₁ and X₃, which may be identical or different, are chosen from threonine and serine;

X₂ is chosen from valine, leucine and isoleucine;

X₄ is chosen from phenylalanine, tryptophan, tyrosine and para-benzoylphenylalanine.

25

3. A molecule as claimed in claim 1 or claim 2, characterized in that it comprises 4 to 8 amino acids, preferably 5 to 7 amino acids, even more preferably 6 amino acids.

30

4. A molecule as claimed in any one of claims 1 to 3, characterized in that x₀ = 1 and the acyl chain -Y-CO- is a linear chain which is represented by the formula -C_pH_{2p}-CO-, p being an integer ranging from 1 to 23.

35

5. A molecule as claimed in claim 4, characterized in that:

- when $n = 1$, Y represents $-C_pH_{2p}-$ and p can be 1, 2, 3, 4, 5, 6, 7 or 8;
- 5 - when $n = 0$, Y represents $-C_pH_{2p}-$ and p can be an integer ranging from 5 to 23.

6. A molecule as claimed in any one of the preceding claims, characterized in that one or more of the 10 following conditions are verified:

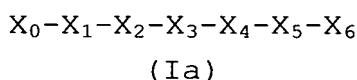
- at least one of X_1 and of X_3 represents threonine, preferably X_1 and X_3 both represent threonine,

- X_2 is chosen from isoleucine and valine,

- X_4 is chosen from phenylalanine, tyrosine and *para*-15 benzoylphenylalanine,

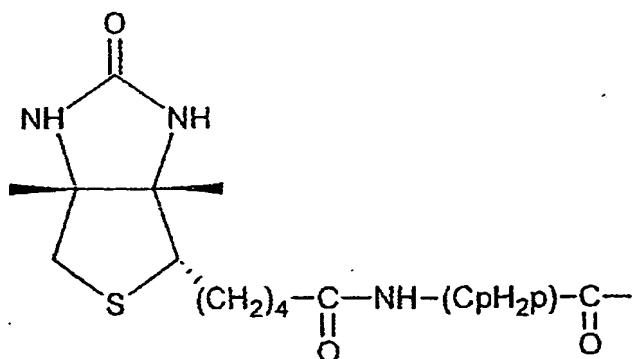
- at least 2 of the integers $x_0, x_1, x_2, x_4, x_7, x_8$ and x_9 are equal to 1, even more preferably at least 3 of these integers are equal to 1.

20 7. A molecule as claimed in claim 1, characterized in that it corresponds to formula (Ia):



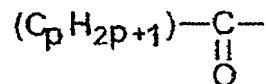
25 in which the bonds $q_i, i+1$ between the amino acids X_i and X_{i+1} , $i = 1, \dots, 5$, are peptide or pseudopeptide bonds.

8. A molecule as claimed in claim 7, characterized in 30 that X_0 represents:



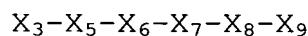
with p ranging from 1 to 8, preferably from 2 to 6, and X_4 represents a *para*-benzoylphenylalanine group.

5 9. A molecule as claimed in claim 7, characterized in that X_0 represents a group:



10 with p ranging from 3 to 23, preferably from 5 to 19.

10. A molecule as claimed in claim 1, characterized in that it corresponds to formula (Ib):



15 (Ib)

in which:

- at least one of the bonds between two successive amino acids is a pseudopeptide bond,

20 or

- one of the α -carbons of one of the amino acids is a modified α -carbon.

11. A molecule as claimed in claim 1, characterized in 25 that it belongs to the list:

CH₃-(C_nH_{2n})-CO-TVTYDY with n=4,6,8,10,12,14,16,18
CH₃-(C_nH_{2n})-CO-TISYDY with n=4,6,8,10,12,14,16,18
CH₃-(C_nH_{2n})-CO-TVSYKF with n=4,6,8,10,12,14,16,18
CH₃-(C_nH_{2n})-CO-TITFDY with n=4,6,8,10,12,14,16,18
CH₃-(C_nH_{2n})-CO-TITYKF with n=4,6,8,10,12,14,16,18
CH₃-(C_nH_{2n})-CO-TITYEY with n=4,6,8,10,12,14,16,18
CH₃-(C_nH_{2n})-CO-TITYDF with n=4,6,8,10,12,14,16,18
CH₃-(C_nH_{2n})-CO-TVTYKL with n=4,6,8,10,12,14,16,18
CH₃-(C_nH_{2n})-CO-TVTYKY with n=4,6,8,10,12,14,16,18
CH₃-(C_nH_{2n})-CO-TVTFKF with n=4,6,8,10,12,14,16,18
CH₃-(C_nH_{2n})-CO-TITYDL with n=4,6,8,10,12,14,16,18
CH₃-(C_nH_{2n})-CO-TITFDY with n=4,6,8,10,12,14,16,18
CH₃-(C_nH_{2n})-CO-TVTFKF with n=4,6,8,10,12,14,16,18
CH₃-(C_nH_{2n})-CO-TVTYKF with n=4,6,8,10,12,14,16,18
Biot-Ava-TVT-Bpa-KF
Biot-Ava-TVT-Bpa-KY
Biot-Ava-TVT-Bpa-KL
Biot-Ava-TVT-Bpa-DF
Biot-Ava-TVT-Bpa-DY
Biot-Ava-TVT-Bpa-DL
Biot-Ava-TIT-Bpa-KF
Biot-Ava-TIT-Bpa-KY
Biot-Ava-TIT-Bpa-KL
Biot-Ava-TIT-Bpa-DF
Biot-Ava-TIT-Bpa-DY
Biot-Ava-TIT-Bpa-DL
Biot-Ava-TVT-Bpa-EF
Biot-Ava-TVT-Bpa-EY
Biot-Ava-TVT-Bpa-EL
Biot-Ava-TIT-Bpa-EF
Biot-Ava-TIT-Bpa-EY
Biot-Ava-TIT-Bpa-EL
Biot-Ava-TVT-Bpa-NF
Biot-Ava-TVT-Bpa-NY
Biot-Ava-TVT-Bpa-NL
Biot-Ava-TIT-Bpa-NF
Biot-Ava-TIT-Bpa-NY

Biot-Ava-TIT-Bpa-NL

in which Biot represents a biotinyl group, Ava represents a δ -aminovaleric acid group, Bpa represents
5 a *para*-benzoylphenylalanine group

TNL*GPS

SEK*RVW

TRA*LVR

SNL*NDA

10 THI*VIK, in which * represents:

- a bond chosen from ester, thioester, keto methylene, keto methyleneamino, N-methylamide, inverse amide, Z/E vinylene, ethylene, methylenethio, methyleneoxy, thioamide, methyleneamino, hydrazino, carbonylhydrazone
15 and N-amino bonds,

or

- the presence of an aza-amino acid as a substitution for one of the amino acids adjacent to *.

20 12. A molecule, characterized in that it comprises a molecule as claimed in any one of claims 1 to 11 coupled, on its C-terminal end and/or on its N-terminal end, with another molecule which promotes its bioavailability.

25

13. A medicinal product, characterized in that it comprises a molecule as claimed in any one of claims 1 to 12, in a pharmaceutically acceptable carrier.

30 14. The use of a molecule as claimed in any one of claims 1 to 12, for preparing a medicinal product for use in the prevention and treatment of a pathology involving the proteasome.

35 15. The use as claimed in claim 14, characterized in that the pathology is selected from: cancers involving hematological tumors or solid tumors, autoimmune diseases, AIDS, inflammatory diseases, cardiac pathologies and the consequences of ischemic processes

whether at the myocardial, cerebral or pulmonary level, allograft rejection, amyotrophy, cerebral strokes, traumas, burns, pathologies associated with aging such 5 as Alzheimer's disease and Parkinson's disease, and the appearance of the signs of aging.

16. The use as claimed in claim 14, for preparing medicinal products for use in the radiosensitization of a tumor.

10

17. A cosmetic and/or dermatological composition comprising a molecule as claimed in any one of claims 1 to 12, in a cosmetically and/or dermatologically acceptable carrier.

15

18. A cosmetic process for preventing or treating the appearance of the effects of chronological skin aging and/or of photoaging, characterized in that it comprises the application of a molecule as claimed in 20 any one of claims 1 to 12, in a cosmetically acceptable carrier.